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ABSTRACT

NovaNet is an individualized, computer-based instruction program that is used in the Wake County Public School System (WCPSS), North Carolina, for high school course credit, remediation, and enrichment. NovaNet was first used in WCPSS in 1996, and in 1999 WCPSS received a 3-year federal grant to expand the use of NovaNET to all high schools. In the 2001-2002 school year, Nova NET students earned significantly higher grade point averages and fewer F's than before participating in NovaNET. NovaNET Students did not show significantly greater gains than students in a comparison group that had similar demographic and academic characteristics; however, analyses revealed that the two groups differed somewhat in terms of prior suspensions, so results should be interpreted with caution. Some schools had much greater participation and student success than others. Strategies used by successful NovaNET programs include individualizing coursework, supplemental counseling and behavior modification, selecting the most appropriate students, requiring students to sign a contract promising to complete the course, and giving offline assignments to supplement NovaNET. Extending successful school practices to all schools could increase overall program impact. (Contains 29 figures.) (Author/SLD)

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NOVANET STUDENT OUTCOMES 2001-2002

Kristin Harlow & Nancy Baenen

REPORT SUMMARY

ABSTRACT

In the 2001-02 school year, NovaNET students earned significantly higher GPAs and fewer F's than before participating in NovaNET. NovaNET students did not show significantly greater gains than students in a comparison group that had similar demographic and academic characteristics; however, analyses revealed that the two groups varied somewhat in terms of prior suspensions, so results should be interpreted with caution. Some schools had much greater participation and student success than others. Strategies used by successful NovaNET programs include individualizing coursework; supplemental counseling and behavior modification; selecting the most appropriate students; requiring students to sign a contract promising to complete the course; and giving offline assignments to supplement NovaNET. Extending successful school practices to all schools could increase overall program impact.

BACKGROUND

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NovaNET is an individualized, computer-based instruction program that is used in the Wake County Public School System (WCPSS) for high school course credit, remediation, and enrichment. NovaNET was first used in WCPSS on a limited basis by Cary High School and Mary E. Phillips High School beginning in the spring of 1996. In 1999, WCPSS received a three-year federal grant called Safe Schools/Healthy Students (SS/HS), which provided funding for NovaNET implementation in all WCPSS high schools and two alternative middle schools. By the 2001-02 school year, almost all NovaNET funding was provided locally. This evaluation of the NovaNET program in WCPSS focuses on its second full year of implementation and was conducted to aid future funding decisions.

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MAJOR FINDINGS

NovaNET students in the 2001-02 school year earned, on average, significantly higher grade point averages (GPAs) and significantly fewer F's after participating in NovaNET. However, academic performance differed considerably between school programs. For example:

- ✓ The number of students participating in NovaNET during the day varied from 18 in one school to 149 in another.
- ✓ The percent of NovaNET courses passed upon completion varied from 49% in one school to 94% in another.
- ✓ For NovaNET students who had GPAs available, average GPA changes from before to after NovaNET participation varied from –0.36 at one school to +0.61 at another.

Success of NovaNET students also varied by the reason the student was referred. It is interesting to note that students who failed a course the previous year and used NovaNET to regain the credit had the lowest pass rate but the highest increase in GPA.

Suspensions were not positively correlated to NovaNET participation. Although NovaNET is correlated with positive academic outcomes, there is no indicated correlation with behavior change.

NovaNET students' academic performance, measured by GPAs, F's, and End-of-Course exams (EOCs), did not differ significantly from the comparison group. Although students were matched on previous year GPA, eighth grade End-of-Grade test scores, free and reduced-price lunch eligibility, and grade, the comparison group appeared to differ in terms of prior suspensions and course failures. These differences could influence results.

QUESTIONS FOR CONSIDERATION

Although NovaNET students did not show overall academic improvement compared to the comparison group, student improvement was seen in specific schools. Method of implementation seems to be key in improving the efficacy of NovaNET. Questions for consideration include:

- ✓ What specifically makes one school more successful than another?
- ✓ Should expectations be set for number of students served and for standards of implementation?
- ✓ Is closer monitoring necessary?
- ✓ Will NovaNET students be even more successful after the third year of full implementation?

It is important to encourage sharing and discussion among NovaNET coordinators and establish procedures for disseminating and formalizing successful practices to ensure the most effective NovaNET implementation.

This report is divided into four main sections: demographics, outcomes for all NovaNET students, results using a comparison group, and results disaggregated by school.

NOVANET STUDENT OUTCOMES
2001-02

PROGRAM OVERVIEW

NovaNET is an individualized, computer-based instruction program that is used in the Wake County Public School System (WCPSS) for high school course credit, remediation, and enrichment. The program is self-paced and tests the students' mastery of subject matter after each unit. All traditional high schools using NovaNET receive funding for at least one full-time NovaNET coordinator, who works in the NovaNET lab and provides assistance to the students as needed.

NovaNET was first used in WCPSS on a limited basis by Cary High School and Mary E. Phillips High School beginning in the spring of 1996. In 1999, WCPSS received a three-year federal grant called Safe Schools/Healthy Students (SS/HS), which provided funding for NovaNET implementation in all Wake County high schools and two alternative middle schools. By the 2001-02 school year, almost all NovaNET funding was provided locally. This evaluation document provides continued information about the performance of the NovaNET program in WCPSS, and was conducted to aid the decisions for future funding and implementation.

Information about the NovaNET program through the 2000-01 school year can be found in NovaNET 2000-01: Analyses of Student Outcomes Relative to a Comparison Group (Harlow & Baenen, 2002) and in Strategy 17: NovaNET Online Learning System Year 2 Program Evaluation (Faircloth & O'Sullivan, 2001). Both documents are available on the WCPSS Web site at http://www.wcpss.net/evaluation-research/ or from the Evaluation & Research Department.

STUDY DESIGN

Data Sources

The NovaNET coordinator at each school provided data about the students enrolled in NovaNET, including:

- Student ID
- NovaNET course attempted
- Final grade in NovaNET course
- Entry and withdrawal date
- Reason the student was referred to NovaNET

Demographic and achievement data for the NovaNET students were obtained from district central computer files. A comparison group of students was chosen based on the following criteria:

- 2000-01 Grade Point Average (GPA) within .1
- Eighth grade reading and math End-of-Grade test scores
- Free or reduced-price lunch eligibility (FRL)
- Grade
- Gender
- Race/Ethnicity
- Special Education
- Age within 1 year

Creating exact matches using these criteria was not possible for all students; only 420, or 33.8%, matched on all eight criteria. Students were included in the final comparison group if they matched on the first four criteria. The comparison group was comprised of 665 students (53.5% of the NovaNET participant file); special attention was paid to matching 2000-01 GPA to create the best comparison of academic performance between groups. Figure 1 shows the demographics of NovaNET students and the comparison group.

Figure 1
NovaNET and Comparison Group Characteristics (n=665)

		NovaNET Overall	NovaNET with Matches	Comparison Group
Required Matches	**Average 2000-01 GPA**	1.51	1.52	1.58
	Average 8th-grade EOG			
	Reading	157.3	158.2	158.7
	Math	179.9	183.4	184.8
	FRL	16.6%	24.4%	24.4%
	Grade			
	8	.1%	.2%	0
	9	25.8%	27.5%	27.8%
	10	20.1%	21.7%	21.4%
	11	19.7%	20.3%	20.6%
	12	34.4%	30.4%	30.2%
Other Matches	**Gender**			
	M	58.6%	58.8%	59.0%
	F	41.4%	41.2%	41.1%
	Race/Ethnicity			
	Black	50.5%	50.2%	49.3%
	White	40.5%	44.5%	46.9%
	Other	9.0%	5.3%	3.8%
	Special Education (Not AG)	30.3%	29.8%	25.0%
	Average Age	15.7	15.6	15.4

Methods

This report provides NovaNET data from the 2001-02 school year. The questions addressed include:

- whether students who participated in NovaNET had better outcomes than a comparison group on GPA, EOC test grades, and suspensions,
- whether outcomes differed by school or other variables, and
- how schools with the most successful programs implemented NovaNET.

Changes discussed in this report were measured both by significance testing and effect size.

DEMOGRAPHICS

Collecting demographic information on NovaNET participants is important to ensure that NovaNET is serving the students for whom it was intended. In the 2001-02 school year, 1,244 WCPSS students participated in NovaNET, an average of 69 students per school. Demographic information was compiled for 1,186 of those students.

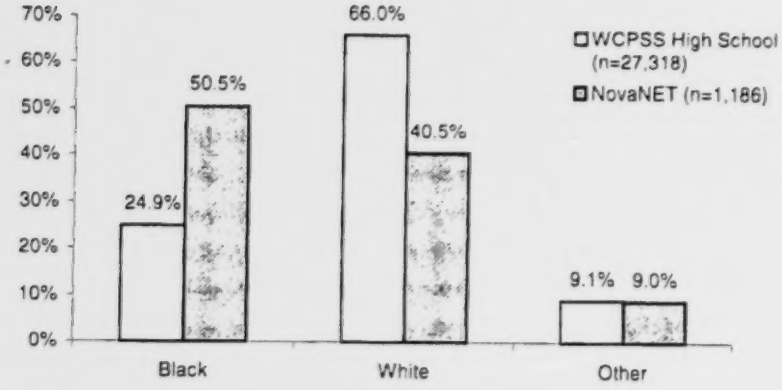
Demographic statistics are depicted in Figure 2.

- ✓ More NovaNET students are male (59%) than female (41%).
- ✓ Black students are over-represented (51%) in the NovaNET program compared to the district (26%), while there were fewer white students (41%) in NovaNET than there are district-wide (62%).
- ✓ Students in NovaNET were more likely to receive free or reduced-price lunch (FRL) (17%) than the WCPSS high school population (10%), and were also more likely to receive special education services (30% vs. 14%).
- ✓ NovaNET students were more likely to have scored below grade level on the 8th-grade EOG tests than WCPSS students in general (see Figure 3).
    - 39% of NovaNET students scored below grade level on the reading EOG, compared to 11% of all WCPSS students.
    - 46% of NovaNET students scored below grade level on the math EOG, compared to 14% of all WCPSS students.

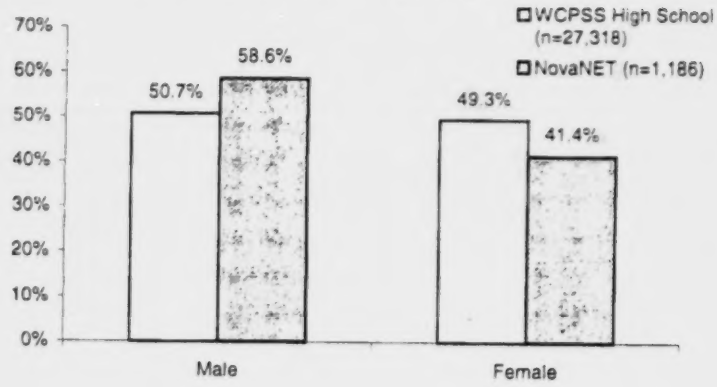
The demographics of NovaNET students suggest that NovaNET was serving the at-risk student population during the 2001-02 school year that it was intended to reach.

Figure 2
Demographics of NovaNET Students Compared to WCPSS, 2001-02

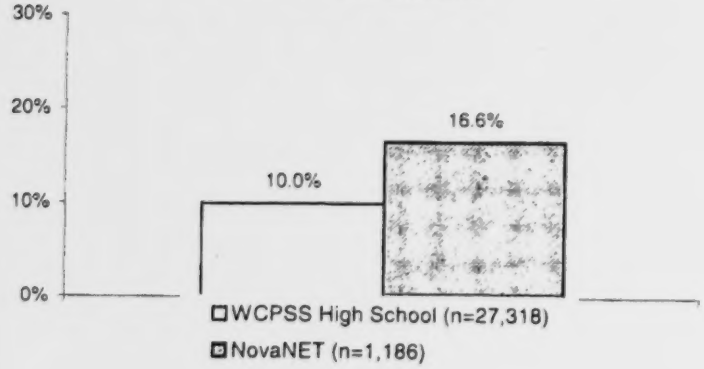
Ethnicity of NovaNET Students Compared to WCPSS High School Students



Gender of NovaNET Students Compared to WCPSS High School Students



Percent of NovaNET Students Eligible for Free/Reduced Lunch Compared to WCPSS High School Students



Percent of NovaNET Students Receiving Special Education Services Compared to WCPSS High School Students

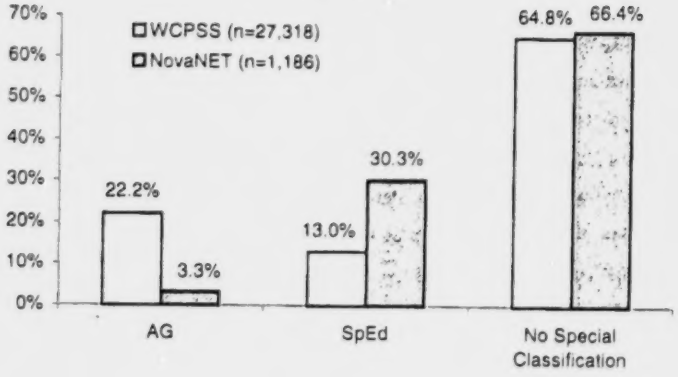
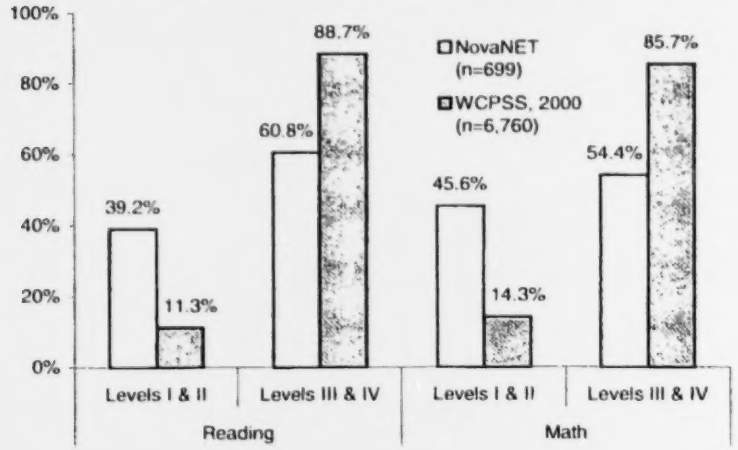


Figure 3
NovaNET 8th-grade EOG Levels Compared to WCPSS



RESULTS

All NovaNET Students

In the 2001-02 school year, NovaNET students passed 83.2% of the 1,384 attempted courses for which final grades were available. In addition to whether they passed the course, we examined the change in GPA for the NovaNET students from 2000-01 to 2001-02 and the number of F's earned. GPA data were only used if GPA was available for both the 2000-01 and 2001-02 school years. As a result, first-time 9th-grade NovaNET participants were not included in these analyses.

As shown in Figure 4, the average GPA for NovaNET students increased .19 points ($T=6.53$, $p<.0001$). However, the data were disaggregated to measure the success of students who successfully completed the NovaNET course as opposed to students who began the course but withdrew or failed. This often implies withdrawal since NovaNET courses are self-paced and students can repeat units indefinitely until they pass. Successful NovaNET students increased their GPA an average of .25 points ($T=7.00$, $p<.0001$), larger than the average increase overall. The students who were not successful in completing the NovaNET course increased their GPA only .07; this increase was not statistically different from zero ($T=1.30$, $p>.05$).

Figure 5 illustrates that the average number of F's earned by NovaNET students decreased significantly since the year before NovaNET participation ($T=-6.34$, $p<.0001$). In addition, students who successfully completed the NovaNET class earned even fewer F's than the group as a whole, and students who failed the NovaNET course actually earned *more* F's than before NovaNET, although not significantly more. This may be tautological until it is noted that most students are in NovaNET because they had failed a course the previous year; therefore, simply failing the course again would result in the same number of F's, not more.

Figure 4
GPA Before and After NovaNET

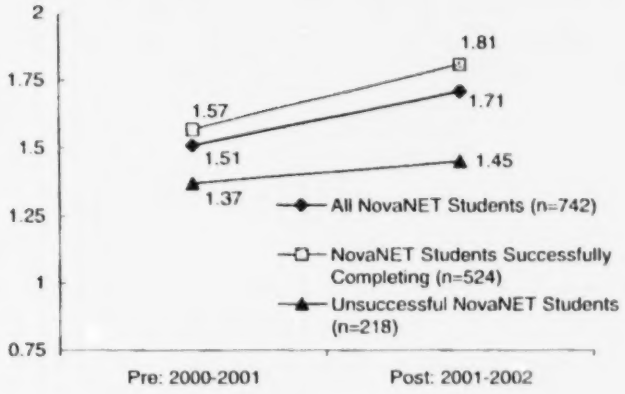
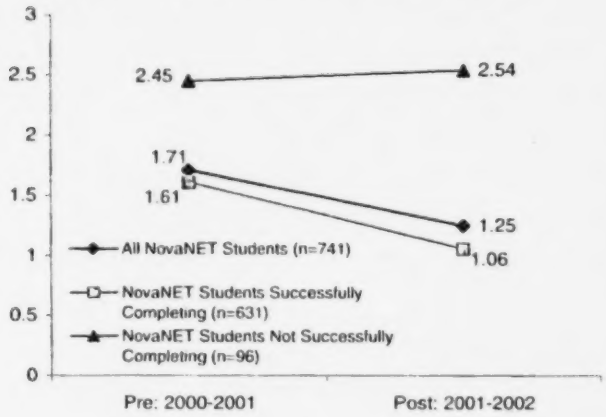


Figure 5
Number of F's Before and After NovaNET



By Grade Level

The number of NovaNET students varied by grade level (see Figure 6). The largest percentage of NovaNET students was in 12th grade (34%), followed by 26% in ninth grade.

As Figure 7 shows, the rate of success in NovaNET courses varied by the grade level of the students. The lowest rate of success (74.8%) was earned by 9th graders, perhaps because many 9th graders were retainees. The highest success rate was earned by 12th graders, which indicates that 12th graders missing credits before graduation were successfully recovering them. However, it should be noted that the 10th-grade success rate was almost as high and that 9th- and 10th-grade students are at greatest risk of dropping out after failing courses.[1]

[1] Kaase, K. J. (2002). Annual progress report on students who drop out 2000-01. (Evaluation & Research report number 02.22) Raleigh, NC: Wake County Public School System.

Figure 6
Number of NovaNET Students in Each Grade (n=1,185)

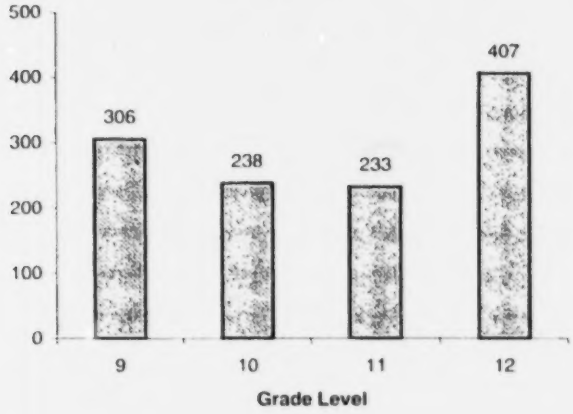
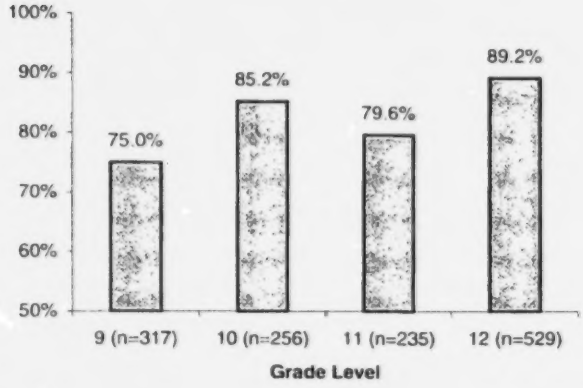


Figure 7
NovaNET Students' Completed Course Pass Rate by Grade



Data representing the GPA increase for each grade must be interpreted carefully; no first-time 9th graders had a GPA for the 2000-01 school year (pre-GPA). Therefore, all 9th graders represented in Figure 8 had been retained from the previous year.

With this caveat in mind, results show that 12th graders have the greatest increase in GPA. Using a paired t-test, 9th grade ($T=3.72$, $p<.001$) and 12th grade ($T=4.41$, $p<.0001$) have statistically significant increases. These data suggest that NovaNET is most helpful in increasing the academic performance of 12th graders and 9th graders who had been retained. Figure 6 shows that NovaNET is most often used in 9th and 12th grades; schools not following this pattern may benefit from prioritizing NovaNET use in 9th and 12th grades.

Figure 8
NovaNET Students' Change in GPA by Grade

Grade	Pre-GPA	Post-GPA	Change in GPA
9 (n=73)	0.94	1.17	0.23**
10 (n=163)	1.50	1.69	0.19
11 (n=167)	1.51	1.56	0.05
12 (n=339)	1.64	1.90	0.26**

** Significant at the p<.001 level

By NovaNET Use

Although NovaNET was first implemented for students to recover course credit when they had previously failed, NovaNET has been implemented successfully in a number of new ways. NovaNET was used in 2001-02 by 441 students to regain a credit from a course they had failed the previous year. However, 296 students used NovaNET to catch up in a course that they were failing at the semester mark, to avoid failing the course in the first place. In addition, 110

students used NovaNET to take an elective not otherwise available to them. Ninety-eight students, mostly from East Wake High School, used NovaNET in remedial math or reading competency classes. Finally, 222 students used NovaNET in other ways, such as courses for homebound students, block scheduling, and curricula to help students who enter WCPSS mid-year to catch up. NovaNET is also used as a part of Project SOAR, an after school program. Project SOAR students are not included as a part of this report.

Figure 10 shows that the pass rate of NovaNET courses varied by the reason for using NovaNET. The lowest pass rate was 79.1%, earned by those students using NovaNET to try to earn a credit that they had failed the previous year. The next higher pass rate of 84.3% was earned by students trying to recover a credit that they were failing mid-year. Electives were passed at a rate of almost 84.6%, while 91.3% of students in competency courses passed completed courses, the highest percentage of all groups. Using the chi-squared significance test, the variation in pass rate is significant ($X^2 = 14.40$, $p<.01$). The category that contributed most to the variation was competency; the pass rate was 7.88 percentage points higher than the expected pass rate of 83.4%. This indicates that using NovaNET for competency courses may be more effective than other uses in improving academic success.

Figure 9
Number of NovaNET Students by NovaNET Use

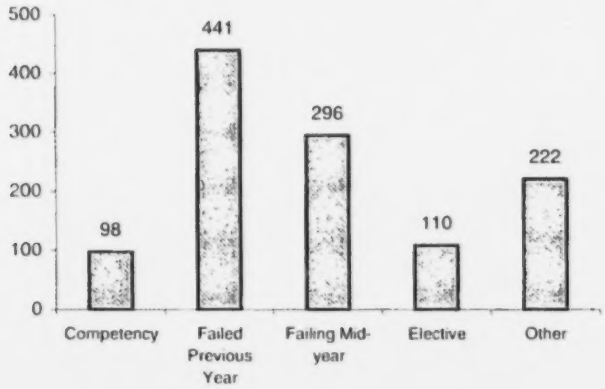
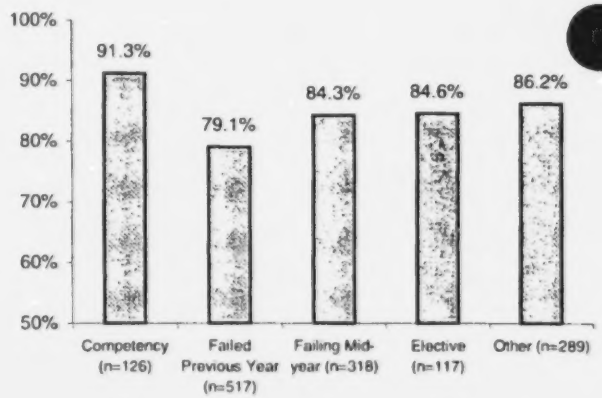


Figure 10
NovaNET Students' Completed Course Pass Rate by NovaNET Use



NovaNET students' changes in GPA varied widely by purpose of use. We used a paired t-test to find the significance of change in GPA by NovaNET use. Students using NovaNET to prevent failing a course that they had been failing mid-year showed no increase in GPA, although avoiding an F may have prevented their GPA from decreasing. The largest increase in GPA (by .3 grade points) was earned by students who used NovaNET to regain course credit they had failed the previous year ($t=5.15$, $p<.0001$). Students using NovaNET for competency courses saw an average increase of .26 GPA points, which is also a significant increase ($t=2.23$, $p<.05$). The increase implies that NovaNET remediation for reading and math competency may have had a positive impact on performance in other courses.

It is interesting to note that students attempting to regain a credit that they failed the previous year earned the highest average increase in GPA but the lowest pass rate for NovaNET courses attempted. These results may reflect the success of NovaNET in getting students back on track

for graduation; however, these students may need another intervention either instead of or in addition to NovaNET for future academic success.

Figure 11
GPA Increase by Reason for NovaNET Use

NovaNET Purpose	2000-01 Final GPA	2001-02 Final GPA	Change in GPA
Competency (n=51)	1.32	1.57	+0.25*
Failed Previous Year (n=270)	1.35	1.70	+0.35**
Failing Mid-year (n=180)	1.61	1.61	+0.00
Elective (n=61)	1.64	1.76	+0.12
Other (n=105)	1.78	1.94	+0.16

* Significant at the p<.05 level; ** Significant at the p<.001 level

By Subject

As shown in Figure 12, NovaNET students attempt more than twice as many math courses as any other NovaNET subject. In Figure 13, he success rate of courses is illustrated. The success rate of attempted credits does not vary much by subject in 2001-02. The lowest pass rate was found in science, although success has increased dramatically since the 2000-01 school year, when only 48% of students taking science on NovaNET earned a passing grade.

Figure 12
Number of NovaNET Courses Attempted in Each Subject

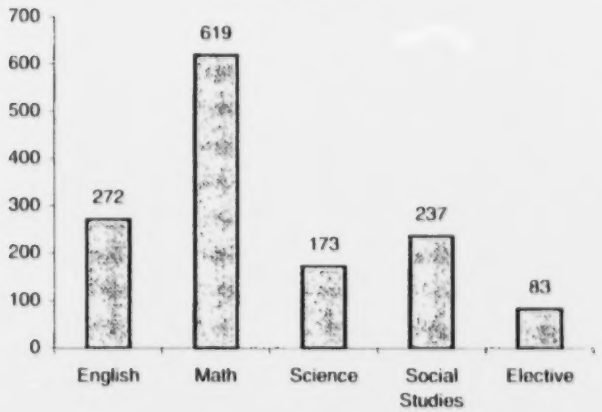


Figure 13
NovaNET Students' Completed Course Pass Rate by Subject

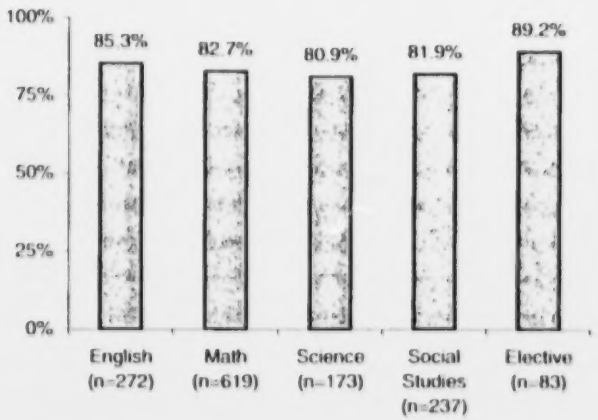


Figure 14 shows the increase in GPA earned by students using NovaNET, by subject. The highest average GPA increase was earned by students attempting social studies NovaNET courses. The smallest average GPA gain was earned in English. Although there is a large variation in GPA gains, it seems that the largest gains were made when the average beginning

GPA was low, and small gains were made when the average beginning GPA was higher. This may be caused by inherent tendency for scores to move toward the average, or the 'regression toward the mean.'

Figure 15 illustrates how NovaNET students scored on the EOCs. Scores of Level III or IV represent achievement at or above grade level. The percent of NovaNET students scoring at or above grade level varied from 11.9% of U.S. history students, to 62.5% of English 1 students. Although NovaNET students passed each of these classes at a rate of about 80%, the students' EOC scores indicate that the level of mastery necessary to pass the EOC varies by course.

One interpretation of these results is that the NovaNET courses are not as rigorous as the same class in the traditional classroom, and that the students are not learning as much. However, the fact that the NovaNET students did not score significantly differently than their matches suggests another interpretation: that these students would score below grade level even after taking the course in the traditional classroom.

Figure 14
Increase in GPA by
NovaNET Course Subject

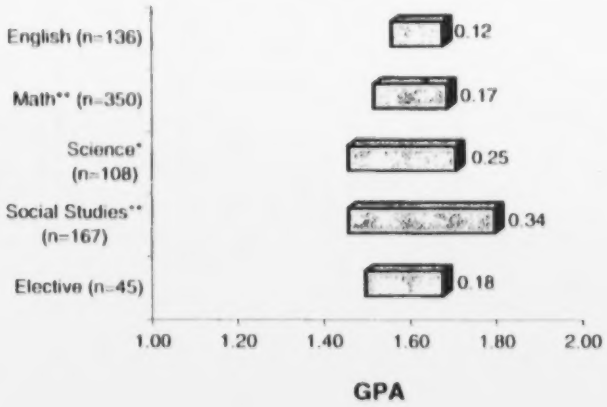
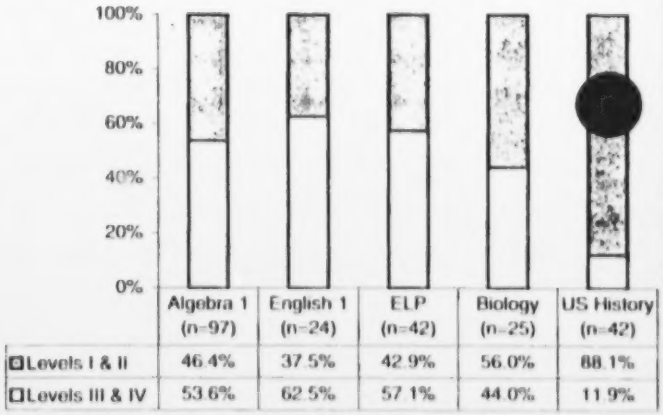


Figure 15
EOC Levels by
NovaNET Course Subject



	Algebra 1 (n=97)	English 1 (n=24)	ELP (n=42)	Biology (n=25)	US History (n=42)
Levels I & II	46.4%	37.5%	42.9%	56.0%	88.1%
Levels III & IV	53.6%	62.5%	57.1%	44.0%	11.9%

Compared to a Comparison Group

As shown in Figure 16, NovaNET students' average GPA increased by .14 points in the 2001-02 school year, and the comparison group increased by .24 points. The comparison group's increase is larger by a marginally significant using a t-test ($T=2.13$, $p<.05$). However, the effect size of the difference between the two GPA increases is 0.14, which is small. This indicates that the difference in increases in GPA between the NovaNET and comparison groups is not large enough to attribute a negative educational impact to NovaNET. In addition, the comparison group begins with fewer average F's than the NovaNET group, indicating that even after matching on important characteristics, the matching group is different in some way.

Students in NovaNET earned on average .3 fewer F's after participating in NovaNET, which is similar to the decrease observed in the match group over the same time period ($T=0.44$, $p>.05$). Although NovaNET students were successful in decreasing the number of F's, they were not

more successful than the comparison group. NovaNET students did, however, have more F's initially than the comparison group.

The data shows that NovaNET has not improved students' academic performance, as measured by GPA and F's, any more than for similar students. There is more than one possible explanation for these outcomes. It could be that NovaNET is not more helpful than regular classroom instruction for most students, or that some students in the comparison group were receiving additional support. Suspension results also suggest that NovaNET may not work well with some students with three or more days of suspension the prior year. It is possible that, with more consistent implementation and use across schools, results would look more positive for NovaNET. The academic achievement of NovaNET students as a whole does not preclude positive outcomes for individual students or for schools who more effectively implemented NovaNET.

Figure 16
Average GPA Increase of NovaNET Students (n=450) Compared to a Comparison Group (n=450)

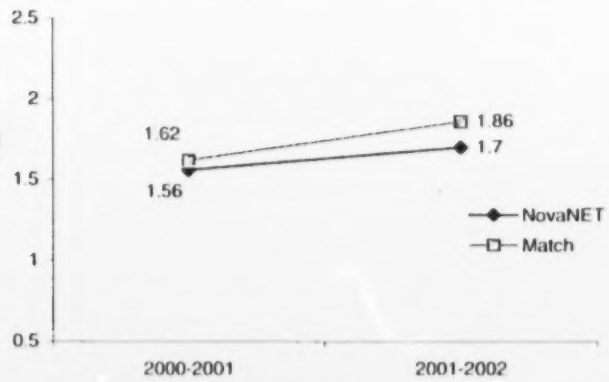
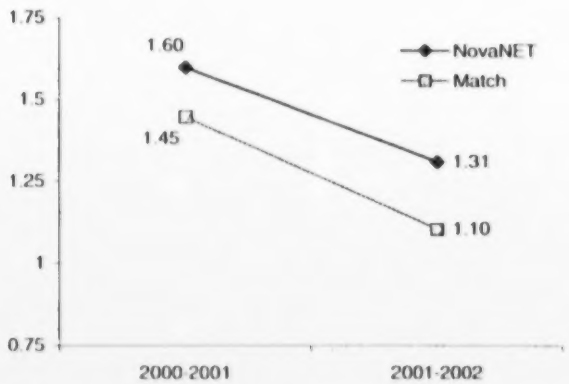


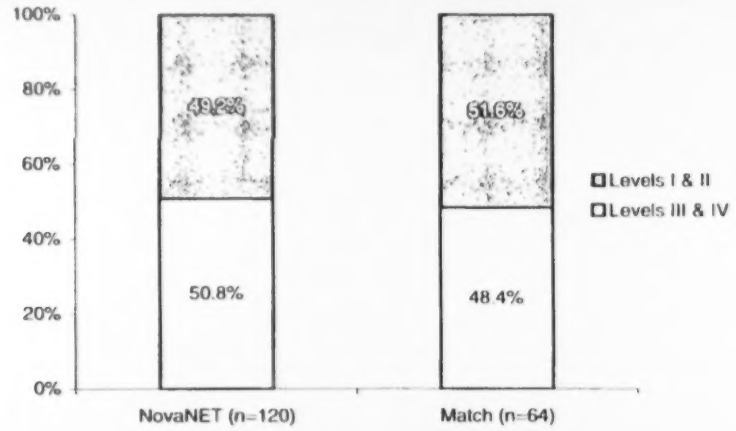
Figure 17
Average Number of F's (n=450) Compared to a Comparison Group (n=450)



*Pre- and post-GPA values for NovaNET students are different from data earlier in the section because Figures 16 and 17 only include those students for whom matching students are available.

Overall, the NovaNET students scored at grade level on EOCs for NovaNET courses slightly more often than their matches, but the difference is not statistically significant (X^2=0.096, p>.05). This result adds strength to the finding that GPA increases were not educationally different. NovaNET students as a whole do not show better academic performance than their matches.

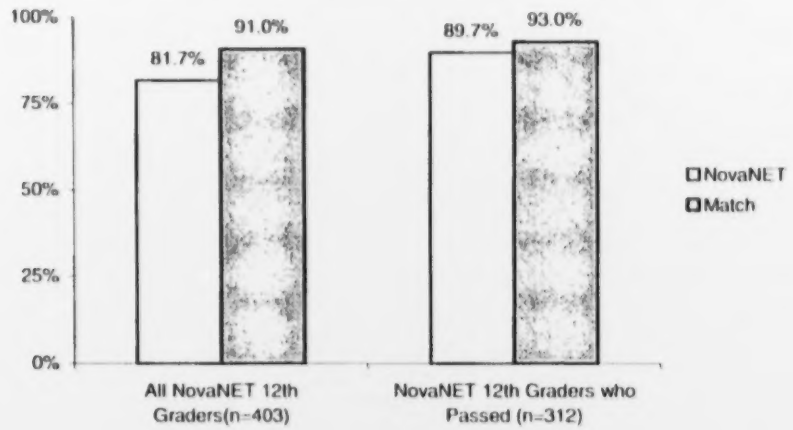
Figure 18
EOC Levels of Students in NovaNET Courses Compared to a Comparison group



Graduation Rate

The most often cited claim of NovaNET proponents is that NovaNET helps seniors to graduate on time when they are in danger of failing a class or are otherwise short of credits. Although it is too soon to know whether these students will ultimately drop out, the on-time graduation rate for NovaNET students is not has high as matched 12th graders, as illustrated in Figure 19.

Figure 19
NovaNET Graduation Rate



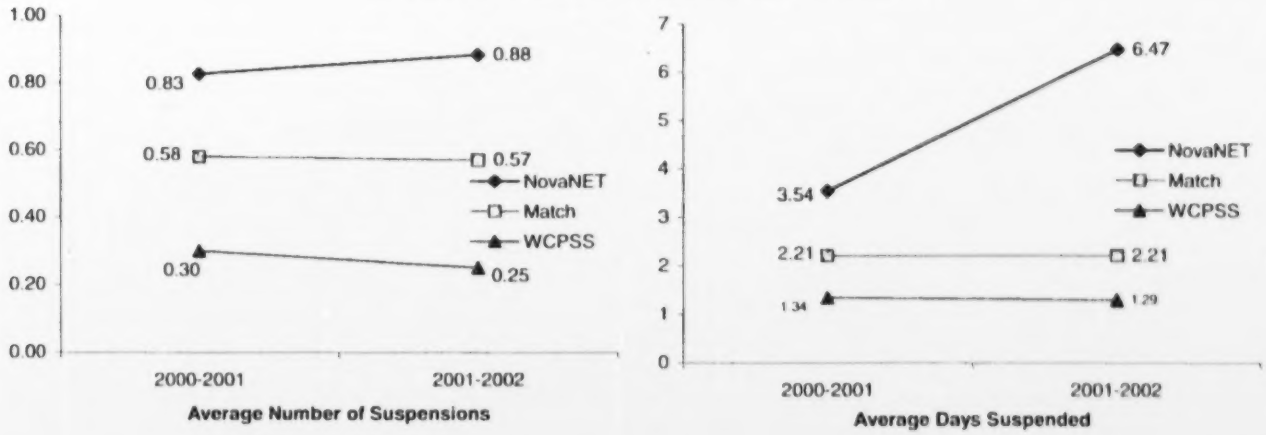
If all 12th-grade NovaNET participants are included in the graduation statistic, we find using the chi-squared test that there are significantly more students in the comparison group who graduate than in the NovaNET group (X^2=7.49, p<.01). This difference could mean that NovaNET is not as successful in helping students graduate as first anticipated. Or it could mean that struggling students who reach 12th grade are strongly motivated to succeed – whether supported through NovaNET, in another way, or not at all.

If we look only at the NovaNET students who passed their NovaNET class (and their matches), there is no significant difference between the NovaNET graduation rate and the graduation rate of the matches (X^2=1.01, p>.05). As a result, passing a class taken on NovaNET does improve a student's chance of graduating on time, but does not make it more likely that the student will graduate than someone who never took a NovaNET course in the first place. These results may be influenced by the fact that it is impossible to find a perfect comparison group, or students in the comparison group may have received other support.

Suspensions

NovaNET was included in the Safe Schools/Healthy Students grant with the vision that it would impact behavioral as well as academic outcomes. The theory was that if students were more hopeful about school, they would not act out as often. However, this theory is not supported by the data (see Figure 20). The number of suspensions, as well as the average number of days suspended, increased after students participated in NovaNET.

Figure 20
Number of Suspensions and Number of Days Suspended
NovaNET Students vs. Matching Students

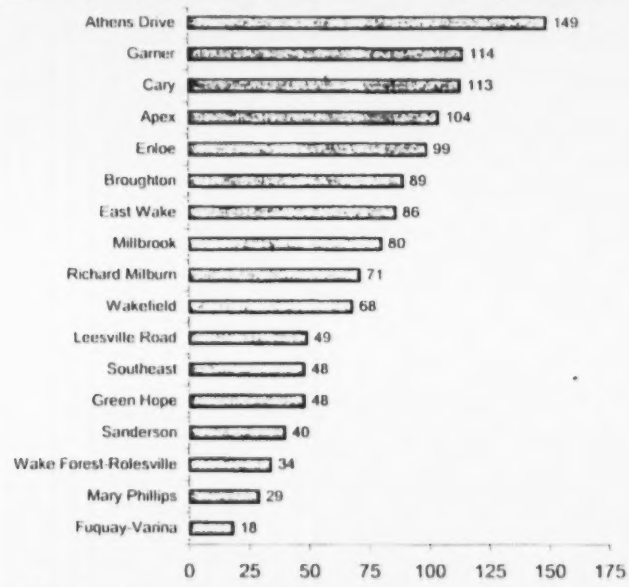


The large disparity in the number of suspensions between the NovaNET students and their matches suggests that, although matched on important characteristics, the groups are different in terms of school behavior; the comparison group had more stable suspension rates than NovaNET students.

By School

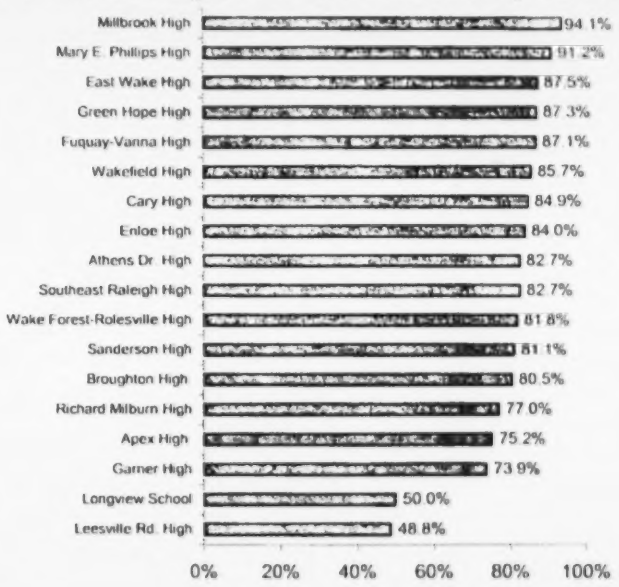
Figure 21 illustrates the large variation in numbers of students served in NovaNET in various schools. In addition to the traditional NovaNET students listed, a few schools offer NovaNET through Project SOAR, an after-school program. Fuquay-Varina reported 136 SOAR students using NovaNET, Wake Forest-Rolesville reported 61 students, Sanderson reported 22 students, and Athens Drive reported 27 additional students. All statistics and calculations in this report reflect only traditional students, not those using NovaNET as a part of Project SOAR.

Figure 21
Number of NovaNET Students Served by School



* Total students represented in this graph is higher than the actual total because some students were served at more than one school.

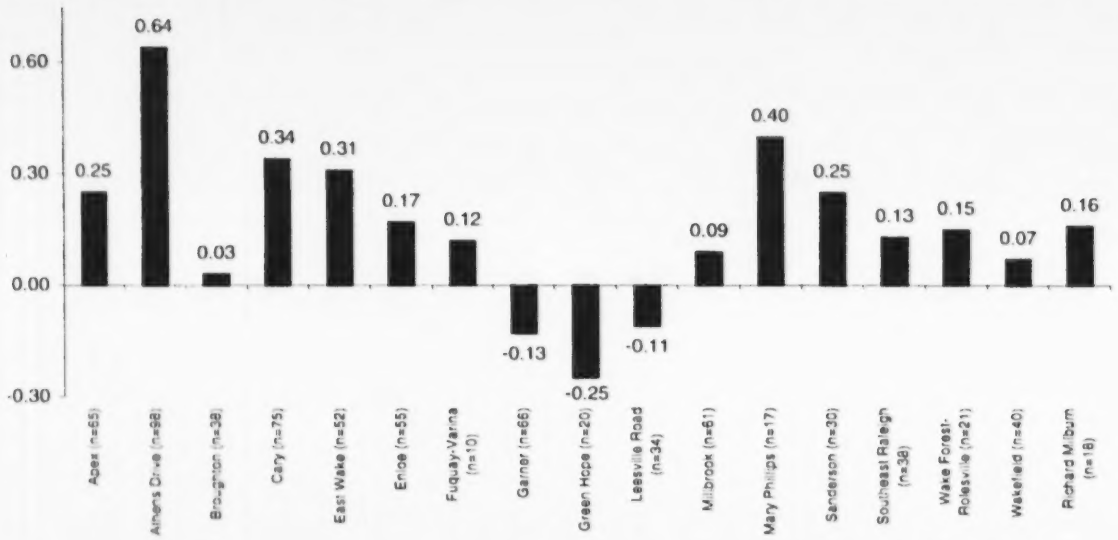
Figure 22
NovaNET Completed Course Pass Rate by School



Although Longview, Richard Milburn and Mary Phillips are alternative schools and therefore have much smaller total populations, the other high schools are fairly comparable in size. The remaining variation in the number of students served illustrates the difference in emphasis placed on the NovaNET program across schools.

The percentage of successfully completed NovaNET courses varies widely from school to school. Only 48.8% of completed courses resulted in passing grades at Leesville Road, as opposed to 87.5% at East Wake, 91.2% at Mary Phillips High School, and 94.1% at Millbrook High School.

Figure 23
NovaNET Students' Change in GPA by School



The mean increase in GPA for NovaNET students from the 2000-01 school year to the 2001-02 school year varied widely between schools. Three schools actually saw a drop in mean GPA. In contrast, the most successful schools were Athens Drive High School, which had a mean increase of 0.64, Mary Phillips High School, which had a GPA increase of 0.40, and Cary High School, which saw a mean increase of 0.34. Using a paired t-test to test the significance of the increase in GPA for each school, only four schools showed a significant increase: Athens Drive ($t=7.89$, $p<.0001$), Cary ($t=4.08$, $p<.0001$), Apex ($t=3.27$, $p<.01$), and East Wake ($t=2.74$, $p<.01$). The GPA increase at Mary Phillips, although the second highest increase, was not significant because of the small number of students with GPA data available.

Most vs. Least Successful NovaNET Programs

To test the hypothesis that method of implementation is a strong predictor of student outcomes in NovaNET, we took the three most successful traditional schools based on change in GPA (Athens Drive, Cary, East Wake) and compared them with the three least successful schools.

Figure 24 illustrates the difference in outcomes between three most-successful and three least-successful NovaNET programs. Although the low-performing NovaNET programs began with an average GPA .21 points higher than the high-performing schools, they ended with an average GPA .51 points lower than higher performing schools. We did an analysis of variance using the GLM procedure; the post-GPA is significantly higher in the high-performing schools after we adjust for pre-GPA ($F=45.55$, $p<.0001$). The data show that how NovaNET is implemented makes a great difference in the success of the students.

NovaNET students at the three highest-performing schools were almost twice as likely to score at grade level on the NovaNET course EOC than NovaNET students at the three lowest-performing schools. However, due to the small number of students in each group, the difference

is not quite statistically significant (X^2=3.557, p=.059). The large difference in performance among students at these schools adds further weight to the theory that the method of implementation is essential to the NovaNET's effectiveness.

Figure 24
Change in GPA for High-Performing vs. Low-Performing NovaNET Schools

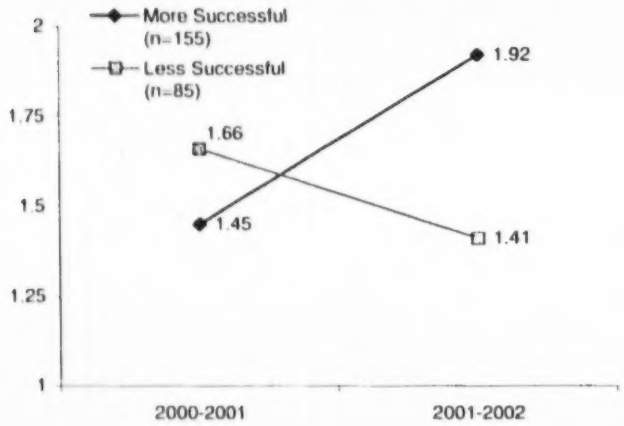
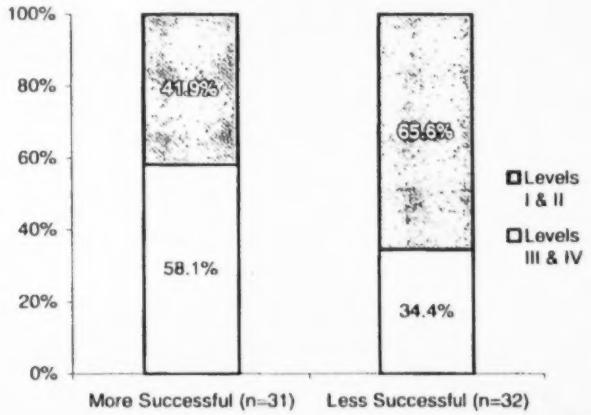
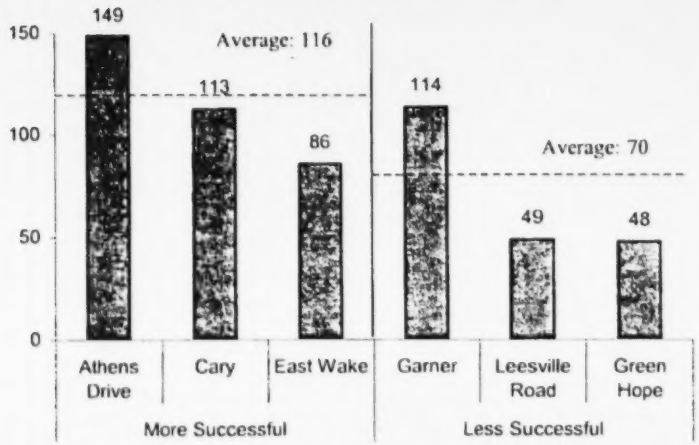


Figure 25
EOC Level for High-performing vs. Low-performing NovaNET Schools



It appears from Figure 26 that the number of students in the NovaNET program was somewhat lower in the less successful programs. Although the correlation between program size and student achievement measured by GPA increase was statistically significant (p<.0001) using a regression analysis, the size of the NovaNET program accounted for only 3.6% of the variation in GPA increase (r^2=0.0357), indicating that overall, program size does not have any real impact on student success. The results shown on the graph may be a result of a few schools that are not as invested in the NovaNET program. As a result, the schools with smaller programs may refer students less often, and commit less time and fewer resources to NovaNET's success.

Figure 26
Number of Students in High-performing vs. Low-performing NovaNET Schools

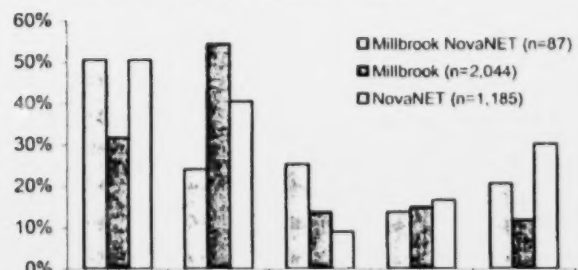


To learn from the successful schools, we looked at how three traditional schools implemented NovaNET.

Millbrook High School

Overall, Millbrook served 80 students in NovaNET in 2001-02. The demographics of the NovaNET students at Millbrook included a higher percentage of non-white students than the general NovaNET average, and a much higher percentage than the school in general. However, Millbrook's NovaNET program served a smaller percentage of both free and reduced-price lunch and special education students than NovaNET in general, although they served a higher percentage of special education students than Millbrook as a whole.

Figure 27
Millbrook NovaNET Demographics



	Black	White	Other	FRL	SpEd
Millbrook NovaNET (n=87)	50.6%	24.1%	25.3%	13.8%	20.7%
Millbrook (n=2,044)	31.8%	54.4%	13.8%	15.0%	11.9%
NovaNET (n=1,185)	50.5%	40.5%	9.0%	16.6%	30.3%

Millbrook, like many other high schools, used NovaNET primarily for course recovery – both for students who had failed a class the previous year and for students who were failing a class at midyear.

One thing that made Millbrook unique was the screening process students go through before they can participate in NovaNET. Millbrook students were permitted to attempt a NovaNET course only if they were at a reading level where they can be successful. In addition, the student was required to be motivated to be in NovaNET and sign a contract promising to complete the course. If the student was not a good match for NovaNET, he or she was sent back to the regular classroom, usually within the first week of the semester.

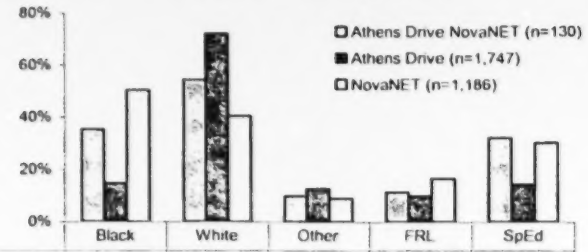
The NovaNET coursework was supplemented in several different ways. Counseling was provided to NovaNET students as a part of the program. The issues that were preventing the students from being successful in previous courses were addressed. Behavior modification was emphasized almost as much as the course itself. In addition, many offline assignments, such as research projects and poster presentations, were given to supplement NovaNET.

There were 15 computer terminals reported at Millbrook. Although the NovaNET class size was about 10 during the fall, the classes became full second semester as students began to fail their current courses. There was one NovaNET class available after school. NovaNET was offered to seniors first, then juniors, and was available to freshmen and sophomores only in special circumstances.

Athens Drive High School

Overall, Athens Drive served 149 students in NovaNET in 2001-02. NovaNET students at Athens Drive High School had a lower percentage of non-white students than NovaNET students in general, but much higher than Athens Drive in general. The percentage of students receiving free or reduced-price lunch was much lower than NovaNET in general, but comparable to Athens Drive's general population. However, the percentage of special education students served in NovaNET at Athens Drive was higher than both NovaNET and Athens Drive in general.

Figure 28
Athens Drive NovaNET Demographics



	Black	White	Other	FRL	SpEd
Athens Drive NovaNET (n=130)	35.4%	54.6%	10.0%	11.5%	32.3%
Athens Drive (n=1,747)	14.8%	72.4%	12.8%	10.0%	14.4%
NovaNET (n=1,186)	50.5%	40.5%	9.0%	16.6%	30.3%

Students at Athens Drive used NovaNET both for course credit recovery and as a tutorial aid for classes in which they were enrolled. Often students used NovaNET for one or two units that they may not have understood during their regular class. In addition, students who enrolled at Athens Drive after the beginning of the school year were offered the chance to use NovaNET to catch up with their class.

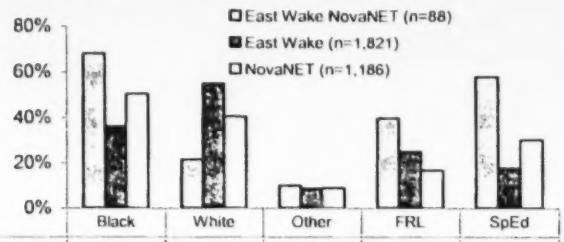
The screening process at Athens Drive varied depending on NovaNET use. Teacher evaluations and recommendations were the only prerequisite for a student to use NovaNET as an aid to regular class work. For a student to use NovaNET as a course recovery tool, he or she must have proven that he or she has made some behavioral changes that show a commitment to NovaNET before attempting a course. If a student was chosen to participate in NovaNET and was still not successful, the student was referred to a counselor for services. The NovaNET coordinator reported that the strategy for choosing students was chosen because space for students was tight and there were many more students who could use NovaNET than there were spaces.

The NovaNET lab had 17 terminals, but the average class size was between 8 and 10 students. Extra spaces were left available for seniors who might need to use NovaNET to make up a credit in order to graduate. In addition, NovaNET was available in the SOAR after-school program.

East Wake High School

Overall, East Wake served 86 students in NovaNET in 2001-02. The demographics of NovaNET students at East Wake High School included more at-risk student in categories of race, free and reduced-price lunch eligibility, and special education than both NovaNET in general and East Wake in general. The success of East Wake's NovaNET program both in percentage of classes successfully completed and increase in GPA shows that the strategies used at East Wake addressed the needs of at-risk students more effectively than the strategies of other schools.

Figure 29
East Wake NovaNET Demographics



	Black	White	Other	FRL	SpEd
East Wake NovaNET (n=88)	68.2%	21.6%	10.2%	39.8%	58.0%
East Wake (n=1,821)	36.2%	55.0%	8.8%	25.0%	17.7%
NovaNET (n=1,186)	50.5%	40.5%	9.0%	16.6%	30.3%

East Wake used NovaNET in two ways. NovaNET was a tool to teach both reading and math competency courses, which are remediation for students attempting to pass the state 10th-grade competency exams. In addition, NovaNET was used for other course credits in the evening program as an alternative source of course credit.

All East Wake students enrolled in reading and math competency courses used NovaNET. In math, NovaNET use ranged from being an aid to class work to being the entire class. NovaNET was also used for learning reading skills, but reading practice was always provided in addition to the NovaNET curriculum.

The timeframe for NovaNET courses is more flexible for the special needs of evening students. In addition, the NovaNET coordinator designed the curricula to meet the needs of students. For example, students were having trouble passing NovaNET science courses in the past. Because the coordinator was a science teacher, he was able to cut unnecessary units and add supplementary material to make the NovaNET science courses more serviceable to WCPSS students. Other NovaNET coordinators have been able to take advantage of this modified curricula.

Strategies

Some strategies used by these successful NovaNET programs included individualizing coursework and supplemental counseling or behavior modification. Selecting the most appropriate students seems to increase the chances that they will be successful as well. A more thorough investigation of successful strategies at different schools would be helpful in identifying best practices to move forward with NovaNET in Wake County.

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